# DIGITAL DC-DC CONVERTER USING DIGITAL MODULATION

## ABSTRACT

A digital DC-DC converter is implemented using first-order delta-sigma modulation, rather than A/D conversion. In the DC-DC converter, a PWM generator converts an input DC voltage to a preset level DC voltage according to an input PWM signal. A converter converts the DC voltage from the PWM generator to a preset level voltage. A delta-sigma modulator converts a feedback voltage Vfd corresponding to the output voltage Vout of the converter to a 1-bit digital voltage Vo according to a preset reference voltage Vref. A counter counts logic 1's in 1-bit digital voltage signals Vo from the delta-sigma modulator. A delay controller controls a high-level delay time according to the number of logic 1's counted by the counter and transfers a PWM signal having the controlled high-level delay time to the PWM generator.